Maintenance and Operation of DOE Alternative Fuels Center

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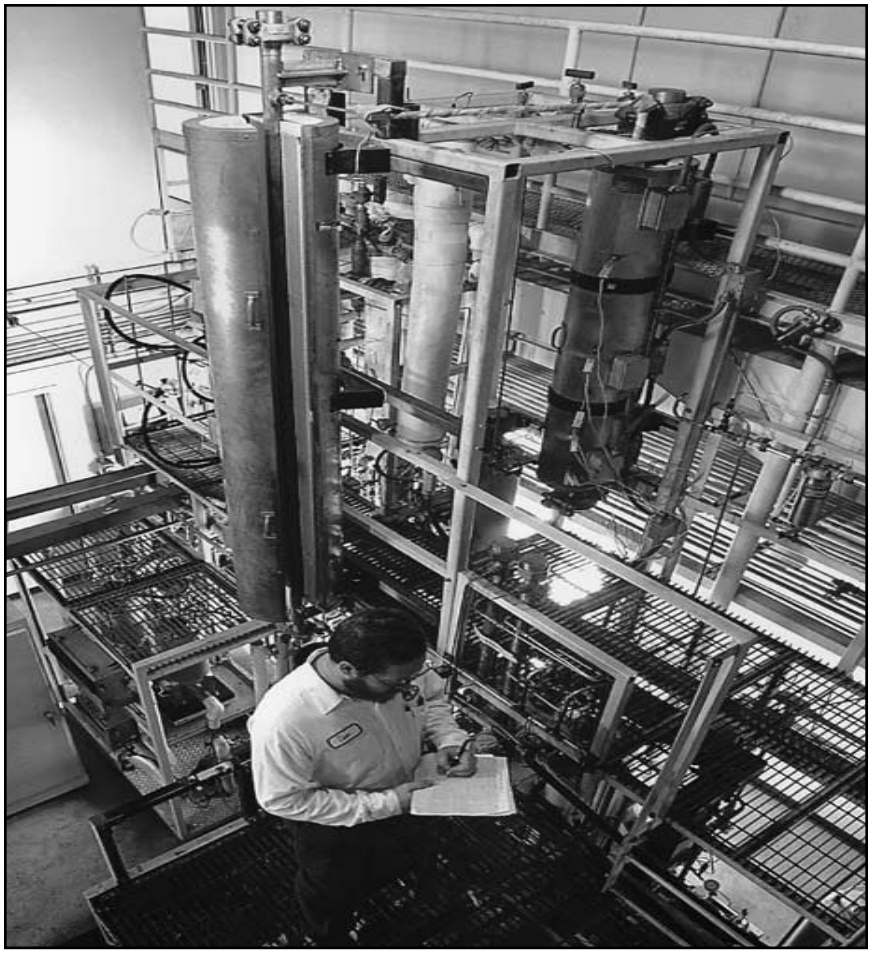


Reactor section of DOE's AFC pilot plant

Objectives

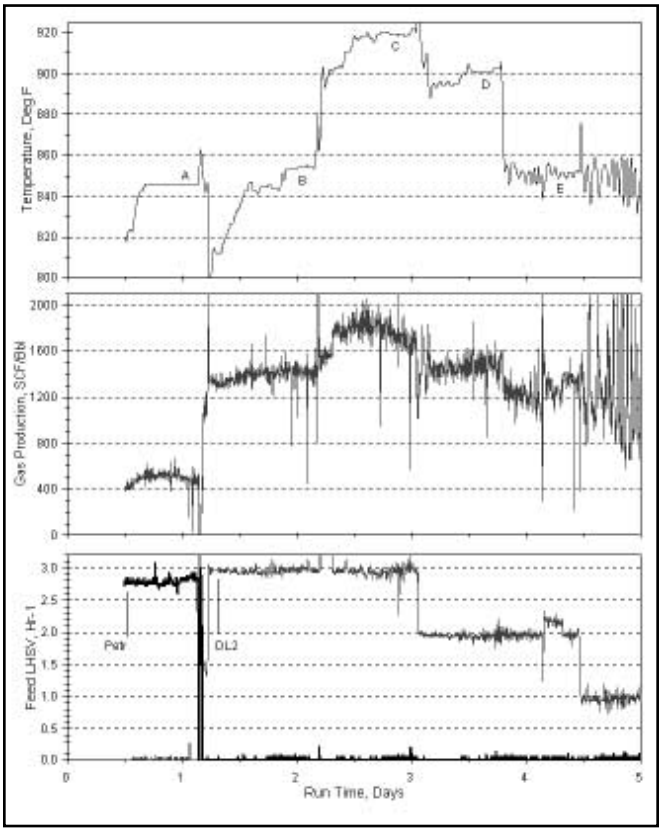
There are four tasks of the work:

- Maintain the hydrogenation pilot plant of the DOE Alternative Fuel Center, test fuels and samples in stor age, and provide for the associated data records and reporting.
- Participate in other government research with the processing facilities.
- Assist industry on a noninterference basis with processing and research.
- Assure safety and health compliance for the work.

Approach

The DOE Alternative Fuels Utilization Program (AFUP) established its Alternative Fuel Center (AFC) at Southwest Research Institute in 1982 with the placement of a hydrogenation pilot plant (photo) capable of producing drum-sized samples of test fuels from shale oil, coal liquids, tar sand bitumen, and other sources. Very interesting samples have been produced by distillation and blending from vegetable oils, ethers, and various alcohols. In supplying AFUP projects with specification and other samples, commercial conditions and practice were used whenever possible to relate the project work to industrial needs, regulators' needs, and the considerations of mobility fuel users. By coordinating internal test fuel

production with schedules for other DOE and industrial work, the quality, utility, and value of alternative fuels have been enhanced.



Timeline from the reforming of hydrotreated coal naphtha

Accomplishments

Over the years, the AFC has produced hundreds of individual samples used in dozens of projects for DOE and other research projects. Thousands of gallons of gasoline, diesel and jet fuel samples have been made including special fuels, like alcohol blends and test fuels with other oxygenates. Work now in progress for DOE titled Reforming and End Use Study of Coal Liquids has produced samples in all of the boiling ranges of interest to liquid fuels. The program used advanced features of the hydrotreater pilot plant, such as historical trending depicted in the timeline figure.

Future Direction

The AFC is a continuing resource for DOE for providing test fuels and experiments with hydrocarbon- and bio-derived sources. Other continuing DOE work includes the End Use Study of the Office of Fossil Energy, which seeks the best way to integrate indirect (Fischer-Tropsch), and direct coal liquids into the refining industry as it will be years hence. Industrial work has moved toward enhanced process efficiency with the exploration of new ways to process and replace petroleum hydrocarbons.

Publications

Erwin, J. 1994. "Vapor Pressure Interactions of Ethanol with Butane and Pentane in Gasoline," presented at the American Chemical Society National Meeting, Symposium on Oxygenates as Fuel Additives, March 18.

Poddar, S.K, K.W. Chum, R. Ragsdale, E. Bechtel, J. Erwin, D.S. Moulton, and B.K. Bailey. 1993. "Evaluation of Catalytically Hydrotreated Cracked Stocks for Reformulated Gasoline by LP Modeling," presented at AIChE meeting, St. Louis, MO, November 7.

Erwin, J., S.K. Poddar, and R. Ragsdale. 1992. "Impact of Fuel Changes on Refining," proceedings of the Workshop on Cost Effective Air Quality Improvement Through Solutions Involving Various Vehicle Emission Control Technologies at Instituto Tecnologico y de Estudios Superiores in Monterrey, Mexico, October 21–22.